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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,928	01/11/2005	Yoshihiro Izumi	1035-561	4954
23117	7590	11/28/2005	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			KUNZER, BRIAN	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/520,928

Applicant(s)

IZUMI, YOSHIHIRO

Examiner

Brian Kunzer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 9-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 14-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/11/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of claims 1-8 and 14-21 in the reply filed on October 24, 2005 is acknowledged.

Claims 9-13 have been withdrawn by applicant and therefore their status in the amended claims should reflect that and should not state "(original)" or "(previously presented)" in front of them. Appropriate correction is required.

### ***Claim Objections***

1. Claim 3 is objected to because of the following informalities: the claim recites the limitation of "a thickness of the first insulating layer is thinner in an area positioned on or above the pixel capacitor section than in other area." It would be grammatically correct if applicant stated, "than in other areas" or "than in another area." Appropriate correction is required.

2. Claims 7, 16, and 20 are objected to because of the following informalities: these claims recite the limitation of a conversion layer that "converts a radiant ray into light." As best understood by examiner, applicant has meant to say "converts a non-visible radiant ray [i.e. x-ray or uv-ray] into visible light" as is detailed in the specification. To say that a radiant ray (of light?) is converted into light renders these claims indefinite (or extremely broad) since the two concepts are one in the same. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 5, 6, 8, 14, 15, and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Choo (US Patent No. 6,617,584).

With respect to claim 1, Choo teaches, from fig. 7 (column 6 lines 1-26), a photoelectric conversion device, comprising: a first insulating layer (68 and 72), formed so as to cover a photoelectric conversion element (formed from 58, 64, 56, and 60) and a connection electrode (90) that are formed on a substrate (51), where the first insulating layer (68 and 72) has an opening portion (78a) extending to the connection electrode (90); and a conductive layer (80, mislabeled on fig. 7, see fig. 9G) formed on the first insulating layer (68 and 72), wherein the conductive layer (80) is formed so as to be connected via the opening portion (78a) to the connection electrode (90).

With respect to claim 2, Choo teaches, from fig. 7 (column 6 lines 1-26), a photoelectric conversion device, comprising: a first insulating layer (68 and 72) formed so as to cover a photoelectric conversion element (formed from 58, 64, 56, and 60) formed on a substrate (51); and a conductive layer (80, mislabeled on fig. 7, see fig. 9G) formed on the first insulating layer (68 and 72), wherein the conductive layer (80) is formed so as to be connected to a connection

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electrode (90), formed on the substrate (51), via an exposing portion (78a) provided on an end face of the first insulating layer (68 and 72 terminate at this electrode) in order to expose at least a part of the connection electrode (90).

With respect to claims 5 and 14, both claims having similar subject matter, Choo teaches, from fig. 7, the photoelectric conversion device wherein the first insulating layer (68 and 72) includes: an inorganic insulating film (68) formed so as to cover the photoelectric conversion element (formed from 58, 64, 56, and 60); and an organic insulating film (72) formed on the inorganic insulating film (68). (Also see column 7, lines 44-46 and 59.)

With respect to claims 6 and 15, both claims having similar subject matter, Choo teaches, from fig. 7 (See column 6, line 4), the photoelectric conversion device further comprising a second insulating layer (82) formed on or above the conductive layer (80, mislabeled on fig. 7, see fig. 9G), which is formed on the first insulating layer (68 and 72).

With respect to claims 8 and 17, both claims having similar subject matter, Choo teaches an image scanning apparatus, comprising the photoelectric conversion device wherein the photoelectric conversion device is used as an image scanning sensor (Specifically, for use as an X-ray imager, see background of the invention and fig. 6).

4. Claims 3, 4, 18 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Ikeda (US Patent No. 6,323,490).

With respect to claim 3, Ikeda teaches, from fig. 69 (column 38, lines 10-43), a photoelectric conversion device, comprising: a first insulating layer (4314 and 4310) formed so as to cover a photoelectric conversion element (formed from 4316, 4312, 4309, and 4304) formed on a substrate (4301) and a pixel capacitor section (formed from 4315, 4307, and 4305) connected to the photoelectric conversion element (through 4315); and a conductive layer (4311) formed on the first insulating layer (4314 and 4310), wherein a thickness of the first insulating layer (4314 and 4310) is thinner in an area positioned on or above the pixel capacitor section than in other areas.

With respect to claim 4, Ikeda teaches, from fig. 69 (column 38, lines 10-43), the photoelectric conversion device wherein: the first insulating layer (4314 and 4310) includes an insulating protective film (4310 made of a silicon nitride film, see column 38, line 32), formed so as to cover the photoelectric conversion element (formed from 4316, 4312, 4309, and 4304), which protects the photoelectric conversion element, and the first insulating layer has a relative dielectric constant which is higher in the insulating protective film (4310) than in a portion (4314 made of an organic benzocyclobutene, see column 38, line 31-32) other than the insulating protective film. (Note that silicon nitride films have higher dielectric constants than benzocyclobutene resins.)

With respect to claim 18, Ikeda teaches, from fig. 69, the photoelectric conversion device wherein the first insulating layer (4314 and 4310) includes: an inorganic insulating film (4310) formed so as to cover the photoelectric conversion element (formed from 4316, 4312, 4309, and

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4304); and an organic insulating film (4314) formed on the inorganic insulating film (4310).

(Also see column 38, line 31-32.)

With respect to claim 21, Ikeda teaches an image scanning apparatus, comprising the photoelectric conversion device wherein the photoelectric conversion device is used as an image scanning sensor (Specifically, for use as an X-ray imager, see background of the invention and fig. 73).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choo (US Patent No. 6,617,584) and Ikeda (US Patent No. 6,323,490) as applied to claims 1, 2, and 3 above, and further in view of Hamamoto (US Patent No. 6,800,836).

With respect to claims 7, 16, and 20 both claims having similar subject matter, as best understood by examiner, Choo and Ikeda do not specifically teach the photoelectric conversion device further comprising a conversion layer, which is formed on or above the conductive layer formed on the first insulating layer, which converts non-visible light into visible light. Although, Ikeda does teach in fig. 15, a conversion layer (202) that converts X-rays into charges. Note that

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it is inherent for a photoelectric conversion device to operate with some sort of conversion layer when dealing with high-energy (ultraviolet, x-ray, gamma) light imaging.

However, Hamamoto, drawn to X-ray image processing systems, teaches, from fig. 4, a conversion layer (3, a scintillator) placed on a photoelectric conversion device that converts incoming X-rays into visible light.

Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have the devices of Choo or Ikeda utilizing the conversion (scintillator) layer of Hamamoto because a conversion layer is required to prevent damage to the pixel cell array from high energy radiation such as X-rays or ultraviolet light.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda-490 as applied to claim 3 above, and further in view of Choo-584.

Ikeda teaches the device of claim 3 as stated above.

Ikeda does not teach that there is a second insulating layer on the conductive layer.

However, Choo teaches, from fig. 7 (See column 6, line 4), a photoelectric conversion device further comprising a second insulating layer (82) formed on or above the conductive layer (80, mislabeled on fig. 7, see fig. 9G), which is formed on the first insulating layer (68 and 72).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to make the device of Ikeda utilizing the second insulating layer of Choo because the insulating layer functions to isolate added conductive layers and also serves as a protective coating to ensure electrical connections against environmental harm in further production steps (cleaning, etching, etc.).




***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Kunzer whose telephone number is (571) 272-5054. The examiner can normally be reached on Monday-Friday 8:00-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BK  
11/16/05

  
HOAI PHAM  
PRIMARY EXAMINER